



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/594,789

07/18/2007

Soo Jin Chua

4276-109

7149

23448

7590

03/30/2010

INTELLECTUAL PROPERTY / TECHNOLOGY LAW

PO BOX 14329

RESEARCH TRIANGLE PARK, NC 27709

EXAMINER

FRITCHMAN, REBECCA M

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

03/30/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/594,789	<b>Applicant(s)</b> CHUA ET AL.	
	<b>Examiner</b> REBECCA FRITCHMAN	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 37-72 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-72 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Detailed Action  
Summary***

This is a Non-Final Office action based on the 10/594789 application attorney response filed 12/17/2009.

Claims 37-72 are pending and have been fully considered.

Claims 63 and 66 have been cancelled.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 37-41 43, 44, 47, 51-54, 60-61, & 68- 71 are rejected under U.S.C. 103(a) as being obvious over TAKAHASHI in US 4595485 in view of RIM in “Ultrasonic Velocity and Absorption in Binary Solutions of Silicon Dioxide and Water”.**

With respect to Claims 37, 41, 47, 68, 70, & 71, TAKAHASHI et al. teach of an oxygen sensor and a method for sensing oxygen comprising a first electrode with a gas permeable film and a second electrode of gas permeable film formed on an insulating substrate(since there is a gas permeable film, the electrodes detect moisture permeation) (abstract). The substrate is covered with an insulating film (liner layer SiO<sub>2</sub>) (column 9, lines 26-36). The reaction of the sensing material with oxygen results in a

Art Unit: 1797

change of electrical current (column 6, lines 61-66, & Table 2). TAKAHASHI et al. also teach of signal evaluation over time (column 12, lines 12-36, & Figure 26). TAKAHASHI et al. do not specifically state that the oxygen sensitive material  $\text{SiO}_2$  is an organic polymer or inorganic polymer. However, it would be obvious to one of ordinary skill from RIM in "Ultrasonic Velocity and Absorption in Binary Solutions of Silicon Dioxide and Water" that the  $\text{SiO}_2$  in TAKAHASHI is a polymer due to the fact that RIM et al. teach of silicon dioxide being a polymer (column 1, lines 5-6). It would have been clear to one of ordinary skill in the art that the liner/insulating layer in TAKAHASHI is a polymer layer due to the fact that it is an insulating film & this means that many  $\text{SiO}_2$  molecules must be attached together (in polymer form).

With respect to Claim 38, TAKAHASHI et al. teach of signal evaluation (calculation) (column 12, lines 12-28).

With respect to Claim 39, TAKAHASHI et al. teach of the oxygen sensitive material being a metal oxide (Claims 2 & 4).

With respect to Claim 40, TAKAHASHI et al. teach of the metal for the metal oxide being magnesium or calcium (Claims 2 & 4).

With respect to Claim 43, TAKAHASHI et al. teach of the electrode being a metal (Claim 8).

With respect to Claim 44, TAKAHASHI et al. teach of the electrode being silver (Claim 8).

With respect to Claim 51, TAKAHASHI et al. teach of the electrodes being located on the surface of the substrate (Claims 16 & 31).

With respect to Claim 52, TAKAHASHI et al. teach of the electrodes being spaced apart and therefore forming a trench (Claim 13).

With respect to Claim 53, TAKAHASHI et al. teach of the sensing element being located in the trench (Claims 15 & 16).

With respect to Claim 54, TAKAHASHI et al. teach of a dense coating layer encapsulating the sensing element (Claim 17).

With respect to Claim 60, TAKAHASHI et al. teach of the whole element being covered by a porous coating as a protective mechanism (column 5, lines 27-41).

With respect to Claim 61, TAKAHASHI et al. teach of the porous coating/protective layer being silicon or aluminum oxide (Claim 11).

With respect to Claim 69, TAKAHASHI et al. teach of the electrodes being located on the surface of the substrate (Claims 16 & 31).

2. **Claims 42, 45, 46, 48-50, 55-59, 62, 64-65, 67, & 72 are rejected under U.S.C. 103(a) as being obvious over TAKAHASHI in US 4595485 with further evidence from RIM in "Ultrasonic Velocity and Absorption in Binary Solutions of Silicon Dioxide and Water".**

With respect to Claim 42 & 45, TAKAHASHI et al. teach of the use of a tin zirconium oxide (Claim 2), which is equivalent to the claimed compounds.

Art Unit: 1797

With respect to Claim 46 & 48, TAKHASHI teach of the use of a Silicon based substrate (column 9, lines 24-25). TAKAHASHI et al. do not teach of the use of a polymer, specifically a silicone, However, the use of this substance for a substrate would have been obvious to one of ordinary skill in the art due to the fact that a silicon substrate would have similar properties to a silicone substrate.

With respect to Claim 49, TAKAHASHI et al. teach of a porous coating layer (barrier layer) (Claim 7).

With respect to Claim 50, TAKAHASHI et al. teach of the porous coating being a metal oxide (aluminum oxide) (Claim 11).

With respect to Claim 55, TAKAHASHI et al. teach of the porous coating comprising polymeric material, silicon compounds (Claim 11).

With respect to Claim 56, TAKAHASHI et al. teach of a hollow cylindrical base which contains a sensing element (column 10, lines 45-56).

With respect to Claim 57, TAKAHASHI et al. do not teach of the hollow space being filled with inert gas, however, it would be obvious to one of ordinary skill to fill this space with inert gas to prevent complications in the oxygen sensing reaction.

With respect to Claim 58, TAKAHASHI et al. teach that it is commonly known to use a cover over the sensing element (column 1, lines 20-31).

With respect to Claim 59, TAKAHASHI et al. do not teach of the cover substrate comprising glass, aluminum, or copper, however, it would have been obvious to one of ordinary skill in the art to use one of these materials due to the fact that they would be un-reactive.

Art Unit: 1797

With respect to Claim 62, TAKAHASHI et al. teach of the porous coating/protective layer being silicon or aluminum oxide (Claim 11). TAKAHASHI et al. do not teach of the protective coating being a metal fluoride, however, this is an equivalent material to a metal oxide for its use as a protective layer.

With respect to Claims 64, 65, & 67, TAKAHASHI et al. teach of the insulating (liner layer) comprising  $\text{SiO}_2$ . TAKAHASHI et al. do not specifically state that the oxygen sensitive material  $\text{SiO}_2$  is an organic polymer or inorganic polymer. However, with evidence from RIM in "Ultrasonic Velocity and Absorption in Binary Solutions of Silicon Dioxide and Water" teach of silicon dioxide being a polymer (column 1, lines 5-6). It would have been clear to one of ordinary skill in the art that the liner/insulating layer in TAKAHASHI is a polymer layer due to the fact that it is an insulating film & this means that many  $\text{SiO}_2$  molecules must be attached together (in polymer form).

With respect to Claim 72, it would be obvious to one of ordinary skill in the art to measure noise, in order to obtain a clearer signal.

### ***Response to Arguments***

The attorney was correct in the understanding that Claims 68, 70, & 71 were rejected under 102(b) in view of Takahashi in the prior rejection. This is made more clear in the instant action.

Applicant's arguments with respect to claims 37-72 have been considered but are moot in view of the new ground(s) of rejection.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to REBECCA FRITCHMAN whose telephone number is (571)270-5542. The examiner can normally be reached on Monday- Friday 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim, Vickie can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

R.F.

***/Angela Ortiz/  
Supervisory Patent Examiner, Art Unit 1797***



Application/Control Number: 10/594,789  
Art Unit: 1797

Page 8